

Shaugh. No. 114501

EAB Log Out Date: AUG 5 1987

To: D. Edwards  
Product Manager 12  
Registration Division (TS-767)

From: Matthew Lorber, Acting Team Leader *ML*  
Ground Water Team  
Exposure Assessment Branch, HED (TS-769)

Attached, please find the environmental fate review of:

Reg./File No.: 264-379

Chemical: Thiodicarb

Type Product: Insecticide

Product Name: LARVIN

Company Name: Union Carbide

Submission Purposes: Protocols for field leaching studies

Action Code: 352

Date In: 6/23/87

EAB#: 70780

Date Completed: 8/5/87

TAIS (Level II) Days  
301 .5

Monitoring study requested: x

Monitoring study voluntarily:           

Deferrals To:

           Ecological Effects Branch

           Residue Chemistry Branch

           Toxicology Branch

## EVALUATION OF THIODICARB PROTOCOLS FOR FIELD LEACHING STUDIES

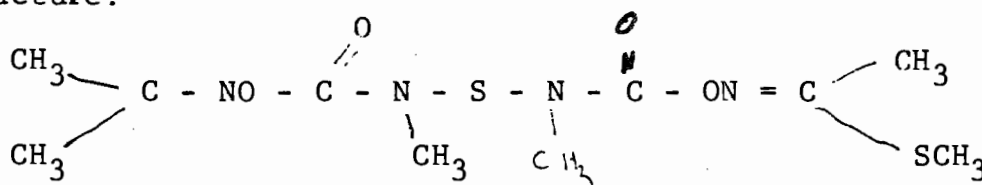
### 1. CHEMICAL:

Chemical name: Dimethyl-N,N'[thiobis[(methylimino)carbonyloxyl]]  
bis [ethanimidothioate]

Common name: Thiodicarb

Trade name: LARVIN

Structure:



### 2. TEST MATERIAL:

Methomyl (formulation not specified - proposed for unsaturated zone monitoring)

Thiodicarb (formulation not specified - proposed for saturated zone monitoring)

### 3. STUDY/ACTION TYPE:

Evaluation of protocols for field research to determine the leaching potential of thiodicarb.

### 4. STUDY IDENTIFICATION:

Title: letter from J.S. Lovell to D. Edwards and two attachments: an internal correspondence dated 6/15/87 from Russell L. Jones to J.S. Lovell and a field study protocol entitled, "Protocols for Thiodicarb Field Research Studies"

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Identifying No: 264-379

Issue Date: 6/23/87

Record No: 198,641

Accession No: not given

### 5. REVIEWED AND APPROVED BY:

Matthew N. Lorber, Acting Team Leader  
Ground Water Team, EAB/HED

Matthew N. Lorber Date 8/15/87

### 6. CONCLUSIONS:

The field studies as proposed are acceptable, with three minor provisions detailed in the "DISCUSSION" Section below.

7. RECOMMENDATIONS:

Inform Union Carbide of the contents of this review.

8. BACKGROUND

Union Carbide is seeking registration of thiodicarb for ornamental and non-crop uses. However, this registration has been denied due to leaching concerns of primarily the first degradate product, methomyl. Based on field studies submitted by the registrant, it is established that thiodicarb metabolizes to methomyl rapidly (less than a week, as short as two days in some cases). Further, methomyl has been shown to hydrolyze slowly, with data in EAB files indicating no hydrolysis after 30 days at pH 5 and 7, but hydrolysis occurring with a half-life of 30 days at pH 9 (see Reg/File No: 352-366, EAB review dated 1/9/85). Finally, thiodicarb has been shown to have some, although limited, mobility with water. Therefore, the concern was raised that thiodicarb could leach with rainfall near the time of application to the point where the primary degradate, methomyl, would not be subject to the typically more rapid microbial decay of the upper soil zones, but rather to the slower process of chemical hydrolysis which predominates in the lower soil zones and the ground water. For these reasons, a registration for ornamentals and noncrop uses was denied based on ground water concerns.

A meeting was held on 10/2/86 between representatives of Union Carbide, and EPA representatives including Sam Creeger (who recommended against the registrations) and Matt Lorber. Union Carbide presented their case that thiodicarb would not be a threat to ground water based on evidence of rapid decay of thiodicarb and methomyl residues. They forwarded this evidence to Dennis Edwards of the Registration Division. Review of that data can be found in EAB files under #70106, dated 1/8/87. Briefly, EAB concluded that leaching events near the time of thiodicarb application potentially could transport methomyl residues, and that actual use field studies would be necessary to evaluate this potential.

Union Carbide has submitted protocols in an attempt to answer EAB's concerns on the leaching potential of thiodicarb. A review of these initial protocols can be found in EAB # 70517, dated 5/5/87. Based on that protocol review and subsequent discussions between myself and Dr. Jones, the revised protocol reviewed here has been submitted.

9. DISCUSSION

The revised protocols are acceptable providing the following

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three provisions are met:

- 1) the thiodicarb field studies will also measure for methomyl in all soil and water samples, and distinguish residue which is methomyl and which is thiodicarb,
- 2) the sensitivity of water samples for thiodicarb and methomyl must be 1 ppb, and the sensitivity of soil samples for both should strive for a 5 ppb sensitivity, with a minimum acceptable level of 10 ppb, and
- 3) the proposal to sample 16 cores and halt the soil sampling if more than 5% of applied shows up in any of the samples, regardless of the average of all samples, is acceptable with the following interpretation: a "sample" is defined as a composite of the highest residue level from each depth increment of 16 cores analyzed, and a calculation of the mass from that "sample" results in less than 5% of applied remaining. For example, the highest of 16 0-1 ft samples represents the 0-1 ft increment of the halt-the-sampling test "sample", and the highest of 16 1-2 ft samples represents the 1-2 ft increment of the "sample", and so on. This is necessary to do since methomyl is mobile, the field is variable, and any single high depth reading itself would not capture this variability.